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June 14, 2017

VIA ECFS

Ms. Marlene H. Dortch
Secretary
Federal Communications Commission
445 12th Street, SW
Washington, DC 20554

Re: *In re Connect America Fund*, WC Docket 10-90

Dear Ms. Dortch:

The Federal Communications Commission ("Commission") recently took a significant step towards closing the digital divide by adopting the weighting for the Connect America Fund ("CAF") Phase II Auction.[1] Although the Commission did not adopt the specific weighting proposed by the undersigned members of the Rural Coalition, we nonetheless believe that the Commission's *CAF Phase II Auction Order* strikes a reasonable balance, is technology neutral, and enables all interested providers the opportunity to compete in the auction. We therefore encourage the Commission to reject ViaSat's untimely proposal to modify those weights through a purported "auction design" concept[2] and move expeditiously to adopt the final parameters of the CAF Phase II Auction. Although ViaSat states that its proposal includes "suggestions for structuring the upcoming" CAF Phase II Auction,[3] the filing, if adopted, would rewrite and revise the core of the Commission's well-reasoned *CAF Phase II Auction Order*. As the attached white paper by auction expert Dr. David Salant explains, ViaSat's proposal effectively abrogates the Commission's decision and is "contrary to" its judgment.[4]

As a threshold matter, ViaSat's filing is procedurally defective as it proposes an entirely new formula for the auction.[5] As such, it amounts to an untimely petition for reconsideration of

[1] *In re Connect America Fund*, Report and Order and Order on Reconsideration, 32 FCC Rcd 1624, 1627–28, paras. 15–17 (2017) ("*CAF Phase II Auction Order*").

[2] *See* Letter from John P. Janka, Counsel to ViaSat Inc., to Marlene H. Dortch, Secretary, FCC, WC Docket No. 10-90 et al., at 1, 6–11 (filed May 2, 2017).

[3] *Id.* at 1.

[4] David J. Salant, Scoring Rules and the CAF-2 Auction Design 7 (2017) (attached as "Appendix").

[5] *See* Letter from John P. Janka to Marlene H. Dortch at 6.

the *CAF Phase II Auction Order* that the Commission should disregard. The Commission has set forth detailed procedures that allow aggrieved parties to ask the Commission to reconsider a final order.[6] A party that fails to follow those procedures forfeits its right to petition the Commission on the matter at hand.[7] ViaSat has done just that: ViaSat had notice of the *CAF Phase II Auction Order*, and had thirty days in which to prepare a petition for reconsideration of that order.[8] Instead of doing so, ViaSat submitted an auction proposal that emphasizes its dissatisfaction with the *CAF Phase II Auction Order* and sets forth a formula for scoring and selecting bids that is emphatically at odds with the auction methodology adopted in that order.[9] Arguments like ViaSat's that "effectively" amount to an "untimely petition" for reconsideration "must be denied."[10]

In addition to its procedural flaws, ViaSat's proposal falls far short on the merits. In adopting the weighting formula, the Commission carefully considered the value of higher speed services with more capacity and low latency services, and adopted weighting that both recognizes that rural areas should receive "reasonably comparable" service, and ensures that the Commission does not have to use universal service funds to rebuild networks after the ten-year funding term is over.[11] Thus, the Commission created a framework for the CAF Phase II Auction that allows all technologies the opportunity to participate, while recognizing the relative value of networks built leveraging universal service resources.[12] This is not only because, as the Commission found, consumers "clearly value" such services more than lower speed, high latency alternatives,[13] but also because such services are "future proof" as they will not become obsolete as demand for faster download speeds increases.[14] However, as Dr. Salant explains, ViaSat's proposed methodology for scoring and selecting bids *categorically* disadvantages higher speed,

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[6] *See generally* 47 C.F.R. § 1.429.

[7] *See id.* § 1.429(*l*)(7), (9).

[8] *See id.* § 1.429(d); Connect America Fund, ETC Annual Reports & Certifications, 82 Fed. Reg. 14,466, 14,466 (Mar. 21, 2017).

[9] *Compare In re Connect America Fund*, 32 FCC Rcd at 1627, para. 15 ("Mathematically, $S = 100 \times B/R + T + L \ldots$"), *with* Letter from John P. Janka to Marlene H. Dortch at 6 (proposing that "[e]ach bid is assigned a quality score" represented by "$Q = R \times (100 - T - L)$").

[10] *In re Syntax-Brillian Corporation*, Forfeiture Order and Notice of Apparent Liability for Forfeiture, 23 FCC Rcd 6323, 6331, para. 17 (2008); *see also, e.g.*, *In re Carl N. Davis*, Memorandum Opinion and Order, 15 FCC Rcd 11,896, 11,897, para. 4 (2000).

[11] 47 U.S.C. § 254(b)(3); *In re Connect America Fund*, 32 FCC Rcd at 1631, para. 24.

[12] *In re Connect America Fund*, 32 FCC Rcd at 1630–31, paras. 21–23.

[13] *Id.* at 1631, para. 24.

[14] *See id.* (emphasizing that "universal service is an 'evolving level' of services, and thus [the Commission] must consider the fact that through the auction we will be providing support to voice and broadband services over a 10-year term").

lower latency bids—unraveling the very foundation of the Commission's decision and threatening to undermine the Commission's commitment to technology neutrality.[15] In addition, such a result is in tension with the statutory directive to achieve service and rates that are "reasonably comparable" to those in urban areas.[16]

What is more, by assigning higher scores to bids in areas with high reserve prices, ViaSat's proposal has the effect of threatening to consume substantial CAF Phase II resources to deploy slower speed services in highest cost, least densely populated areas.[17] As Dr. Salant explains, this approach threatens to leave many rural consumers without any meaningful improvements in service quality, to the benefit of "bidders offering service covering large areas."[18] The result is an inefficient allocation of scarce universal service resources: the Commission would spend more on lower speed technologies that consumers overwhelmingly do not prefer and foreclose access to robust broadband in unserved rural communities.[19]

We therefore urge the Commission to reject ViaSat's untimely proposal to effectively rewrite and undermine the weighting framework adopted by the Commission in the *CAF Phase II Auction Order*.

Respectfully submitted,

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/s/ *Barry Hart*
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/s/ Robert L. Hance
Robert L. Hance
President & CEO
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/s/ Tom Harrell
Tom Harrell
CEO
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[15] Appendix at 8–9.

[16] 47 U.S.C. § 254(b)(3); *see* Appendix at 3–6, 8–9.

[17] Appendix at 7.

[18] *Id.* at 9.

[19] *Id.* at 7.

/s/ Mark Kappler
Mark Kappler
General Manager
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/s/ Duane Highley
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/s/ Bill Scott
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APPENDIX

Scoring rules and the CAF-2 auction design

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June 5, 2017

Abstract

The Connect America Fund (CAF) established an overall budget for the high-cost program to promote availability of high bandwidth services in high cost and rural areas. The CAF-2 auction is the Phase II process for allocating funds, for a ten-year term.

The Phase II auction is designed to meet the objective of allocating the overall budget in a manner having the most beneficial impact on the availability of high bandwidth service in areas that might otherwise not be digitally connected.

The Commission has proposed a multi-attribute descending clock auction for optimizing the allocation of funds. To effectively trade-off quality of service, measured by bandwidth and latency, with coverage, the Commission has proposed a weighted scoring rule for comparing bids offering different quality of service. Under the guise of an auction design proposal, Viasat has proposed a modification of the Commission's weights which

- Distorts the Commission's weights strictly in its favor.
- Excludes price relative to cost as a direct criteria in evaluating offers
- Strictly favors coverage area over quality of service.

The following explains the blatant bias of the Viasat proposal.

1 Summary of main auction design concerns

The Commission has left many of the details of the auction design to a future notice process. The Commission has decided to employ a simultaneous descending clock auction (SDCA) for the high cost subset of the approximately 220,000 census block groups ("CBGs") in the US. The Commission has decided to allow bidders in Phase II to submit offers at the same time which allow for higher and lower bandwidth speeds, Gigabit, Above Baseline, Baseline and Minimum, and two levels of latency, high and low.

Table 1: Bandwidth Tiers

Performance Tier	Speed	Usage allowance	Weight
Minimum	$\geq 10/1$ Mbps	≥ 150 GB	65
Baseline	$\geq 25/3$ Mbps	≥ 150 GB or US median, whichever is higher	45
Above Baseline	$\geq 100/20$ Mbps	2 TB	15
Gigabit	1 Gbps/500 Mbps	2 TB	0

Table 2: Latency

Latency	Requirement	Weight
Low latency	≤ 100 ms	0
High latency	≤ 750 ms and MOS ≥ 4	25

The FCC has decided to use the following scoring rule[1] for a region with "reserve price" R, to compare offers using the bid price B together with the Tier-Weight T and Latency-Weight L from the tables above:

$$S(B,T,L,R) = 100 \times \frac{B}{R} + T + L.$$

[1]See FCC 17-12 Report and Order released March 2, 2017, Section III.A.15.

In other words, bids with higher latency or lower bandwidth can achieve a higher score than bids with lower latency and higher bandwidth by offering a lower price to compensate for the lower quality. Furthermore, the amount by which the bids are expected to be lower - the Tier Weight plus the Latency Weight - is expressed as a percentage of the reserve price. So for example, a bid for Baseline service must be 45% of the reserve price lower than a bid for Gigabit service for the two to be considered equivalent.

2 The Viasat proposal

Viasat and Paul Milgrom have proposed a different scoring rule:

$$Q(B, T, L, R) = R \times (100 - T - L).$$

Viasat proposes that the FCC maximize Q - summed across CBGs - subject to the overall budget constraint. Viasat labels this rule "quality". To go back to the previous example, it might at first appear that the first bidder can never compensate for its higher latency by offering a lower price - except when the lower latency plan for that region would cause the FCC to exceed its budget. From this perspective, in theory, the Viasat rule might appear to favor higher speed, lower latency plans.

However, this is not the case. Generally speaking, the Viasat rule in fact *disadvantages* higher speed, lower latency bids. The Viasat rule tends to result in higher speed, lower latency bids being denied in some service areas in order to set aside budget for small service improvements (such as from Minimum to Baseline service) in other service areas.

3 Examples of Viasat Rule Disadvantaging Higher Speed, Lower Latency Bids

3.1 Example of a shift in service

Suppose there are two areas, A and B, each of which receive bids in three service types - Minimum High latency, Baseline High latency, Gigabit Low latency:

Table 3: Example Bids

Area	Reserve Price	Minimum-High Bid	Baseline-High Bid	Gigabit-Low Bid
Area A	\$20	\$5	\$10	\$15
Area B	\$100	\$25	\$50	\$75

Note that for each of the service types, we've made the percentage of reserve price constant between the two areas to simplify the example. Calculating the FCC score is thus straightforward:

Table 4: FCC Score of Example Bids

	Minimum-High Bid	Baseline-High Bid	Gigabit-Low Bid
Percent of Reserve Price, $100 \times \frac{B}{R}$	25	50	75
Bandwith Tier Weight, T	65	45	0
Latency Weight, L	25	25	0
$S = 100 \times \frac{B}{R} + T + L$	115	120	75

So the Gigabit-Low bids have the lowest scores with 75, followed by the Minimum-High bids with 115, and finally the Baseline-High bids have the highest score with 120.

Suppose that the budget is only \$60. In processing these bids using the FCC approach:

1. The Area B bid for Gigabit-Low service ($S = 75$) is discarded, because it exceeds the budget.
2. The Area A bid for Gigabit-Low service ($S = 75$) fits within the budget and is accepted as provisionally winning. This settles Area A.
3. The Area B bid for Minimum-High service ($S = 115$) fits within the budget and is accepted as provisionally winning. This settles Area B.

The resulting provisionally winning bids total \$40:

Table 5: FCC Provisional Winning Bids

Area	Minimum-High Bid	Baseline-High Bid	Gigabit-Low Bid
Area A			\$15
Area B	\$25		

Now suppose that the Viasat rule is adopted. In this case, a "quality score" needs to be calculated for each area and service type:

Table 6: Viasat Quality Scores, $Q = R \times (100 - T - L)$

Area	Reserve Price	Minimum-High Bid $T = 65, L = 25$	Baseline-High Bid $T = 45, L = 25$	Gigabit-Low Bid $T = 0, L = 0$
Area A	\$20	200	600	2000
Area B	\$100	1000	3000	10000

In processing the bids above using the Viasat approach, we rank the possible allocations by the total of the Q scores:

Table 7: Viasat Bid Processing Approach

Area A Service	Area B Service	Area A Q score	Area B Q score	Total Q score	Total Bids
Gigabit-Low	Gigabit-Low	2000	10000	12000	\$90
Baseline-High	Gigabit-Low	600	10000	10600	\$85
Minimum-High	Gigabit-Low	200	10000	10200	\$80
No Service	Gigabit-Low	0	10000	10000	\$75
Gigabit-Low	Baseline-High	2000	3000	5000	\$65
Baseline-High	Baseline-High	600	3000	3600	\$60
Minimum-High	Baseline-High	200	3000	3200	\$55
No Service	Baseline-High	0	3000	3000	\$50
Gigabit-Low	Minimum-High	2000	1000	3000	\$40
Gigabit-Low	No Service	2000	0	2000	\$15
Baseline-High	Minimum-High	600	1000	1600	\$35
Minimum-High	Minimum-High	200	1000	1200	\$30
No Service	Minimum-High	0	1000	1000	\$25
Baseline-High	No Service	600	0	600	\$10
Minimum-High	No Service	200	0	200	\$5
No Service	No Service	0	0	0	\$0

The maximum Q score with a bid-total that falls within the budget is then achieved by assigning Baseline-High service to both Area A and Area B for a total of $60.

Table 8: Viasat Provisional Winning Bids

Area	Minimum-High Bid	Baseline-High Bid	Gigabit-Low Bid
Area A		$10	
Area B		$50	

In this way the Viasat approach does slightly improve bandwidth in Area B from Minimum to Baseline. But the costs of doing so are threefold:

- The service in Area A is significantly downgraded from Gigabit Low latency to Baseline High latency.
- The total cost is increased by 50%, from $40 to $60.
- The average bid score ($S = 100 \times \frac{B}{R} + T + L$), even when weighting by the reserve price, increases from 108.3 to 120.

Table 9: Bid Processing Comparison

	FCC Approach	Viasat Approach
Area A	Gigabit-Low	Baseline-High
Area B	Minimum-High	Baseline-High
Total of Bids	$40	$60
Average FCC Bid Score	108.3	120

3.2 Example of a shift in regions

In addition to reprioritizing different, lower, tiers of service contrary to the weighting scheme already adopted, the Viasat rule also reprioritizes high-cost areas ahead of low-cost areas in nearly all cases.

Suppose for the same $60 budget, we look at bids in these five regions - all for Gigabit-Low service:

Table 10: Five Regions Example - All Bids are Gigabit-Low

Area	Reserve Price	Bid	FCC Score $S = 100 \times \frac{B}{R}$	Viasat Quality $Q = R \times 100$
Area A	$38	$33	86.8	3800
Area B	$32	$27	84.4	3200
Area C	$25	$20	80.0	2500
Area D	$23	$18	78.3	2300
Area E	$21	$16	76.2	2100

By the FCC rules, the bids are accepted in order of their S score. Thus the bids in the three lowest-cost regions would be accepted. But by the Viasat rule, the Q score is maximized by accepting the two highest-cost regions instead.

Table 11: Bid Processing Comparison - Five Regions Example

	FCC Approach	Viasat Approach
Area A	-	$33 bid accepted
Area B	-	$27 bid accepted
Area C	$20 bid accepted	-
Area D	$18 bid accepted	-
Area E	$16 bid accepted	-
Total of Bids	$54	$60
Average FCC Bid Score	78.3	85.7

4 Systematic Disadvantaging of Higher Speed, Lower Latency Bids by Viasat Rule

The Viasat rule is a linear programming approach, seeking to maximize $\sum Q_j = \sum (R_j \times (100 - T_j - L_j))$ with the constraint that $\sum B_j \leq$ budget.[2] Since we are optimizing with a solitary constraint, this approach can be approximated by ranking the bids using a score S_{Qj} defined by

$$S_{Qj} = \frac{B_j}{R_j \times (100 - T_j - L_j)}$$

,

and then accepting bids as provisionally winning in ascending S_{Qj} order until the budget is reached. This makes the FCC and Viasat approaches comparable by simply looking at how using the S_Q score changes the ranking order compared to the FCC's S score.

In examining these two scores, we find that

- It will never be the case that a GB-Low bid is prioritized ahead of a non-GB-Low bid in the same area under the Viasat S_Q scoring, but is prioritized behind that same non-GB-Low bid under the FCC S scoring.[3]
- Or put differently, if a GB-Low bid has a better S_Q score under the Viasat scoring, then it already had a better S score under the FCC scoring.
- Or put yet a third way, moving to the Viasat S_Q scoring sometimes helps non-GB-Low bids gain priority over GB-Low bids, but never the other way around.

Claim 1 *Let B_1 be a GB-Low bid with associated scores S_1 (FCC) and S_{Q1} (Viasat), and let B_2 be a non-GB-Low bid for the same area with associated scores S_2 and S_{Q2}. Suppose that B_1 was prioritized in front of B_2 under the Viasat scoring; that is, $S_{Q1} < S_{Q2}$. Then $S_1 < S_2$; that is, B_1 would already have been prioritized under the FCC scoring.*

[2] The j subscript denotes a bid for a region. The FCC would be maximizing the sum of the Q_j's over the set of feasible awards, that is those that award one winner to each region.

[3] A "GB-Low bid" is a bid to offer 1 GB Low latency service, and a "non-GB-Low bid" is a bid to offer any other inferior service - that is, Minimum, Baseline, Above-Baseline or Gigabit High latency.

That is, a switch from FCC scoring to Viasat scoring ensures that GB-Low bids never are helped to gain priority over non-GB-Low bids. The algebraic proof for this implication is provided in Appendix A. Thus, assuming Viasat is largely offering plans with bandwidth lower than Gigabit and/or High latency in competition with rivals offering higher speed, lower latency plans, then the Viasat scoring rule explicitly favors its offering. If the FCC were to adopt the Viasat plan, some higher cost regions that could be served with higher speed, lower latency service would instead receive a lower quality service without any corresponding value-savings contemplated by the weighting.

The Viasat proposal appears to favor bidders offering service covering large areas over smaller bidders offering higher-speed and lower-latency regional coverage despite relative weighting. The SDCA auction with thousands of CBGs can be incredibly complex. Bidders need a large, well-prepared team just to be able to manage the submission of several hundred bids in the hour or so typically allotted for each round of bidding.

A Proof of Claim 1

Proof. Let R be the reserve price for the area where B_1 and B_2 are bids. Since B_1 is for GB-Low service, the associated Tier Weight T_1 and Latency Weight L_1 are both 0. Thus $S_{Q1} = \frac{B_1}{R \times 100}$. Let T_2 and L_2 be the Tier Weight and Latency Weight, respectively, for B_2, so that $S_{Q2} = \frac{B_2}{R \times (100 - T_2 - L_2)}$. Then since $S_{Q1} < S_{Q2}$, we have

$$\frac{B_1}{R \times 100} < \frac{B_2}{R \times (100 - T_2 - L_2)}$$

We examine two cases:

Case 1: $S_2 > 100$.

Since R is the reserve price, we know that $B_1 \leq R$. Therefore

$$S_1 = \left(100 \times \frac{B_1}{R}\right) \leq 100 < S_2$$

.

Case 2: $S_2 \leq 100$.

By the definition of S_2, this means:

$$100 \times \left(\frac{B_2}{R}\right) + T_2 + L_2 \leq 100$$

Subtract $(T_2 + L_2)$ from both sides and then multiply both sides by $\left(\frac{R \times (T_2 + L_2)}{100 \times (100 - T_2 - L_2)}\right)$ to get:

$$B_2 \times \frac{T_2 + L_2}{100 - T_2 - L_2} \leq R \times \frac{T_2 + L_2}{100}$$

Then add B_2 to both sides and divide both sides by $(R \times 100)$ to yield:

$$\frac{B_2}{R \times (100 - T_2 - L_2)} \leq \frac{B_2}{R \times 100} + \frac{T_2 + L_2}{10000}$$

Referring back to the first equation in our proof, we have:

$$\frac{B_1}{R \times 100} < \frac{B_2}{R \times (100 - T_2 - L_2)} \leq \frac{B_2}{R \times 100} + \frac{T_2 + L_2}{10000}$$

Mutiplying both sides by 10000 then yields:

$$100 \times \frac{B_1}{R} < 100 \times \frac{B_2}{R} + T_2 + L_2$$

And therefore $S_1 < S_2$. ■